## REMARKS

**File History**

In the Office action of 4/12/2005, the following allowances, rejections, objections and other actions appear to have been made:

> Claims 10-17 are finally withdrawn from consideration.

> Claims 4-9 and 22-23 are indicated to contain allowable subject matter but objected to for dependency from a rejected base claim.

> Claim 21 is rejected under 35 USC §103(a) as being obvious over Mikhaylich et al (US 6,431,959 B1) as combined with Meyer (US 6,224,465 B1).

> Claims 1-3 and 18-20 are rejected under 35 USC §103(a) as being obvious over Mikhaylich and Meyer as above and further in view of Joslyn et al (US 6,203,404 B1).

**Summary of Current Response**

Claims 10-17 are canceled without prejudice.

Claims 4-9 and 22 are rewritten into independent form.

Claims 1 and 21 are canceled.

Claims 2, 4-9 and 22 are amended.

Claim 24 is newly presented.

Arguments are presented concerning the applied art and its proposed combination.

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**Applicants' Overview of Outstanding Office Action**

Applicant sees the outstanding Office action of 4/12/2005 ("OA") as having the following major attributes:

(1) The OA ignores the specific teaching of Mikhaylich '959 that a hard pad be used in one station and a soft one in the other (col. 3, line 18).

(2) The OA ignores the specific teaching of Meyer '465 that the micro-replicated pad should switch from sharpened form to a "dulled" form during the polishing of each individual workpiece (col. 2, line 58). Thus the linear belt must be advanced with the start of each polishing action to present a fresh, non-dulled micro-replicated pad surface for each new workpiece. Moreover, Meyer '465 inherently teaches that rough and smoother polishing occur in the same station given the sharpened and dulled actions of each advancement of the micro-replicated pad belt.

(3) The OA ignores the fact that neither Mikhaylich '959 nor Meyer '465 teaches anything about the termination point of the polishing action.

**Improper Fact Finding re the Joslyn Reference**

In rejecting Claim 2 among others, the PTO states "Joslyn **implied** that an end point detection is employed to stop the polishing at the desired thickness." (OA page 5, 5th line from bottom, emphasis added.)

This finding is improper on two counts.

First it is impermissible to resort to speculation as to what might be "implied" (to some unknown actor). The issue instead, is what is taught to one of ordinary skill at the relevant time. This must be demonstrated by evidence rather than by implication, innuendo, speculation or conjecture.

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Second, Joslyn does not define a specific "desired thickness". Instead Joslyn speaks in terms of ranges, namely, less than 15% and more than 15% of total removal and stopping to a point "proximate" of outer surface of gate lines 28. (col. 3, line 17).

Claim 2 (as rewritten into independent form above) recites: "(c) completing the polishing ... so as to expose in each workpiece, a predefined and detectable surface level; and (d) using end-point detection ... to determine when the predefined surface level of a given workpiece has been exposed."

Joslyn does not expressly or implicitly suggest that end-point detection be used to determine when the predefined surface level of a given workpiece among a first batch of workpieces has been exposed. Neither does Mikhaylich '959. Neither does Meyer '465. Thus the applied combination fails to reconstruct the whole of the claimed subject matter.

**Improper Combining of Meyer '465 and Mikhaylich '959 references**

A fundamental aspect of Meyer '465 is that the polishing pad structure dulls from the sharpened micro-replicated structure of Fig. 7A to the dulled one of Fig. 7C. Meyer states: "In accordance with the present invention, a microreplicated pad is suitably employed in a CMP process **in lieu of** cellular polishing pad." (Col. 5, line 39, emphasis added).

Polishing stops in Meyer '465 before feature 24 is exposed. Planarized surface 18c of Fig. 7D is above feature 24 and does not expose 24. Meyer states:

> Referring now to FIGS. 7(c) and 7(d), as the planarization process continues, distal points 35(b) associated with the underside of pad 31 **become substantially blunt** as a result of surface ablation. At this point--phase two of the process--abrasive particles 37 begin to affect material removal rate. Specifically, as pad 31 moves relative to workpiece 12, blunt distal points 35(b) urge abrasive particles 37 against surface 18(b), thereby polishing down residual undulations 30 in accordance with the chemical and mechanical phenomena associated with the CMP process described above. This gradual blunting of the microreplicated structures in conjunction with the chemical mechanical effects of the slurry **result in a more uniform planar surface 18(c)**.
>
> (col. 6, lines 44-56, emphasis added.)

This is why Meyer calls for the linear advancement of the pad belt at the start of each CMP process (line 67 of col. 6).

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One of the teachings of Mikhaylich '959, by contrast, is that "**each** polishing station 12, 14 preferably **utilizes a different type of polishing pad** and a different type of slurry. In one embodiment, the polishing pad 11 at the first polishing station 12 is a hard pad and the

polishing pad 13 at the second polishing station 14 is a soft pad." (emphasis added). Another of the teachings of Mikhaylich '959, by contrast, is that:

> In order to satisfy the need to reduce defect levels in polysilicon workpieces processed in chemical mechanical polishing or planarization (CMP) systems **and to reduce processing time**, a system and multi-stage polishing and cleaning process is disclosed below.
>
> (col. 2, lines 18-35, emphasis added.)

The teachings of Mikhaylich '959 and Meyer '465 therefore conflict with one another. Advancement of the micro-replicated belt in Meyer '465 so as to bring fresh sharpened pad structures to bear against each next workpiece does not reduce processing time. Use of the micro-replicated belt for both the rough and smoother polishing phases in Meyer '465 conflicts with Mikhaylich '959 calling for separate hard and soft polishing pads.

No motivation to combine the incompatible teachings of Mikhaylich '959 and Meyer '465 is recited in the OA. Instead at page 5, lines 1-4 of the OA, the PTO summarily concludes that modifying Mikhaylich '959 per the teachings of Meyer '465 would have been obvious because of an alleged desire to "increase workpiece throughput" (another way of saying, "to reduce processing time" per Mikhaylich '959 above). However, it is demonstrated above that Meyer '465 does the exact opposite; it slows down throughput because of the need to advance the micro-replicated belt with the start of each CMP process. Moreover, Meyer '465 teaches to use one polish-dulled belt in one station as opposed to hard and soft pads in different stations. Impermissible hindsight is being used to cherry pick desired aspects from each reference while ignoring the others.

**Claim 3**

Claim 3 recites: "wherein said end-point detection includes at least one of optical detection, force feedback detection, temperature detection, and chemical composition detection." The OA does not address the specifics of Claim 3.

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**Claim 18**

Claim 18 recites: "where the second CMP slurries are characterized by... (b.1) relatively high-selectivity ... and[/or] (b.2) relatively good ability to inherently drive the polishing process towards a high degree of planarity ...". The OA does not address the specifics of Claim 18.

## CONCLUSION

In light of the foregoing, Applicant respectfully requests that the rejections be withdrawn and the claims allowed. Should any other action be contemplated by the Examiner, it is respectfully requested that he contacts the undersigned at (408) 392-9250 to discuss the application.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-2257 for any matter in connection with this response, including any fee for extension of time and/or fee for additional claims, which may be required. A request for extension of time accompanies this submission.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 7, 2005.

7/7/05

Attorney for Applicant(s) Date of Signature

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